

Melanoma risk and survival among organ transplant recipients

Hilary A. Robbins¹, Christina A. Clarke², Sarah T. Arron³, Zaria Tatalovich⁴, Amy R. Kahn⁵,
Brenda Y. Hernandez⁶, Lisa Paddock⁷, Elizabeth L. Yanik¹, Charles F. Lynch⁸, Bertram L.
Kasiske⁹, Jon Snyder¹⁰, and Eric A. Engels¹

Journal of Investigative Dermatology

Supplemental material

Supplemental Table 1: Adjusted incidence rate ratios for melanoma among 139,991 non-Hispanic white transplant recipients, stratified by melanoma stage

Characteristic	Localized stage			Regional and distant stage		
	aIRR (95% CI)	p _{het}	p _{trend}	aIRR (95% CI)	p _{het}	p _{trend}
<u>Ultraviolet radiation</u>						
Latitude quintile, degrees north		0.162	0.079		0.322	0.270
≥42.9 (lowest UVR)	Reference			Reference		
36.7-42.8	1.24 (0.83, 1.86)			2.10 (0.84, 5.26)		
30.6-36.6	1.52 (1.00, 2.31)			2.16 (0.84, 5.60)		
≤30.5 (high+highest UVR)	1.38 (0.89, 2.16)			2.20 (0.82, 5.90)		
AVGLO quintile, Wh/km ²		0.056	0.052		0.624	0.131
≤3,552 (lowest UVR)	Reference			Reference		
3,553-4,092	0.90 (0.46, 1.77)			1.18 (0.28, 4.90)		
4,093-4,633	1.24 (0.62, 2.47)			1.43 (0.34, 6.09)		
4,634-5,173	1.22 (0.62, 2.40)			1.53 (0.37, 6.37)		
≥5,174 (highest UVR)	0.68 (0.23, 2.04)			2.38 (0.44, 13.02)		
<u>Induction medications</u>						
Any induction*	1.02 (0.81, 1.29)			1.04 (0.67, 1.62)		
Polyclonal antibody	1.08 (0.81, 1.43)			1.65 (1.02, 2.67)		
T-cell depleting monoclonal antibody	1.00 (0.66, 1.51)			1.17 (0.53, 2.58)		
Interleukin-2 receptor antagonist	1.04 (0.76, 1.42)			0.67 (0.35, 1.26)		
Alemtuzumab	0.97 (0.39, 2.40)			NE		
<u>Maintenance medications</u>						
Cyclosporine	1.17 (0.91, 1.51)			0.80 (0.50, 1.27)		
Tacrolimus	0.98 (0.74, 1.29)			1.33 (0.81, 2.19)		
Azathioprine	1.35 (1.03, 1.77)			0.74 (0.43, 1.28)		
Mycophenolate mofetil	0.88 (0.69, 1.14)			1.23 (0.76, 1.97)		
MTOR inhibitors	0.73 (0.42, 1.29)			0.73 (0.26, 2.01)		
Steroids	1.20 (0.84, 1.71)			0.94 (0.52, 1.71)		
<u>Other</u>						
Deceased donor**	0.83 (0.62, 1.10)			1.61 (0.89, 2.92)		
History of acute rejection***	1.05 (0.70, 1.60)			0.58 (0.20, 1.70)		

aIRR, adjusted incidence rate ratio; p_{het}, p-value for heterogeneity (obtained using a likelihood ratio test and provided for variables with more than two levels), p_{trend}, p-value for trend (obtained by fitting a model in which the specified variable has one degree of freedom); AVGLO, average daily global solar radiation; MTOR, mammalian target of rapamycin; NE, not estimable due to no cases among the exposed group (but not statistically significant)

*Includes T-cell depleting polyclonal antibody, T-cell depleting monoclonal antibody, interleukin-2 receptor antagonist, and alemtuzumab

**Analyzed only among kidney recipients

***Analyzed only among kidney recipients beginning at 1.5 years post-transplant, based on rejection episodes documented by transplant programs on follow-up reports for the first year post-transplant.

Each IRR is adjusted for sex, age (modeled in five categories with one degree of freedom), year of transplantation (four categories), transplanted organ (kidney, liver, lung, heart, other/multiple), and time since transplantation (six categories). Bolded p-values indicate statistical significance.